IN THE CLAIMS:

1. (Currently amended) A compact optical tracking system for magnetic tape, comprising:

a magnet head assembly;

a positioning actuator for changing the position of the magnetic head assembly; and

an optical servo module structure for outputting a position signal to the positioning actuator, causing the positioning actuator to change a position of the magnetic head assembly, wherein the optical servo module structure comprises at least ~~one~~ two optical servo ~~module,~~ modules, each comprising:

an optical beam source for emitting an optical beam;

a detector for detecting an optical beam reflection; and

an optical beam interference composition for interfering with the optical beam and producing a predetermined pattern on a target.

2. (Original) The compact optical tracking system recited in claim 1, wherein each optical servo module contains at least a first and second detector for detecting an optical beam reflection.

3. (Currently amended) The compact optical tracking system recited in claim ~~2~~ 1, wherein the magnetic head assembly comprises a read and a write head; and the optical servo module structure is affixed to the magnetic head assembly between the read and write heads, and the optical servo module structure faces a front side of the magnetic tape.

4. (Currently amended) The compact optical tracking system recited in claim 2, wherein the first detector detects a first spot and the second detector detects a second spot, the second spot being offset from the first spot in a transverse direction by approximately one-quarter of a track spacing between successive tracks on the recording

medium ~~the optical servo module structure comprises a plurality of optical servo modules~~.

5. (Currently amended) The compact optical tracking system recited in claim [[4]] 1, wherein the optical servo module structure is affixed to a side of the magnetic head assembly and oriented to an angle of tape wrap of the magnetic tape.

6. (Currently amended) The compact optical tracking system recited in claim [[4]] 1, further comprising:

a yoke assembly, wherein the optical servo module structure is affixed to a yoke assembly, and the optical servo module structure faces a back side of the magnetic tape.

7. (Original) The compact optical tracking system recited in claim 6, further comprising:

a grating assembly, wherein the grating assembly comprises at least one reference grating used as a target for the predetermined pattern emitted from the optical source within the optical servo module.

8. (Previously Presented) A compact optical tracking system for magnetic tape, comprising:

a magnetic head assembly;

a positioning actuator for changing the position of the magnetic head assembly; and

an optical servo module structure for outputting a position signal to the positioning actuator, causing the positioning actuator to change a position of the magnetic head assembly, wherein the optical servo module structure comprises at least one optical servo module, comprising:

an optical beam source for emitting an optical beam;

a detector for detecting an optical beam reflection; and

an optical beam interference composition for interfering with the optical beam and producing a predetermined pattern on a target;

wherein each optical servo module contains at least a first and second detector for detecting an optical beam reflection;

wherein the optical servo module structure comprises a plurality of optical servo modules;

further comprising a yoke assembly, wherein the optical servo module structure is affixed to a yoke assembly, and the optical servo module structure faces a back side of the magnetic tape;

further comprising a grating assembly, wherein the grating assembly comprises at least one reference grating used as a target for the predetermined pattern emitted from the optical source within the optical servo module;

further comprising an outboard reference grating on the grating assembly, wherein the outboard reference grating is affixed to the grating assembly past the extent of the magnetic tape; and

an outboard servo module, wherein the predetermined pattern emitted from the optical source within the outboard servo module uses the outboard reference grating as a target.

9. (Original) The compact optical tracking system recited in claim 8, wherein the positioning actuator is configured between the yoke assembly and the magnetic head assembly, and wherein only the magnetic head assembly is moved by the positioning actuator.

10. (Original) The compact optical tracking system recited in claim 8, wherein the positioning actuator is configured adjacent to both the yoke assembly and the magnetic head assembly, wherein the yoke assembly and the magnetic head assembly are moved by the positioning actuator.

11. (Original) The compact optical tracking system recited in claim 8, wherein one of the reference grating and outboard reference grating contain a reference index on the reference grating.

12. (Original) The compact optical tracking system recited in claim 8, wherein the grating assembly is affixed to the magnetic head assembly between the read and write heads.

13. (Original) The compact optical tracking system recited in claim 8, wherein the outboard reference grating is affixed adjacent to one of the read and write heads.

14. (Original) The compact optical tracking system recited in claim 8, further comprising:

a fine positioning actuator for adjusting the magnetic head assembly relative to one of the reference grating and the outboard reference grating.

15. (Original) The compact optical tracking system recited in claim 11, further comprising:

a fine positioning actuator for adjusting the magnetic head assembly relative to the reference index on one of the reference grating and the outboard reference grating.

16. (Original) The compact optical tracking system recited in claim 8, further comprising:

a linear actuator for loading magnetic tape onto the magnetic head assembly.

17. (Original) The compact optical tracking system recited in claim 8, further comprising:

a rotary actuator for loading magnetic tape onto the magnetic head assembly.

18. (Currently amended) The compact optical tracking system recited in claim [[4]] 1, wherein the optical beam is a laser beam.

19. (Currently amended) The compact optical tracking system recited in claim [[4]] 1, wherein the optical beam interference composition is a hologram.

20. (Currently amended) The compact optical tracking system recited in claim [[4]] 1, wherein the optical beam interference composition is two or more parallel slits.

21. (Currently amended) A compact optical tracking system for magnetic tape, comprising:

a magnet head assembly comprising:

a magnetic head and

an optical servo module structure for outputting a position signal to the positioning actuator, causing the positioning actuator to change a position of the magnetic head assembly, wherein the optical servo module structure comprises at least ~~one~~ two optical servo ~~module~~ modules, each comprising:

an optical beam source for emitting and optical beam;

a detector for detecting an optical beam reflection; and

an optical beam interference composition for interfering with the optical beam and producing a predetermined pattern on a target.

22. (Original) The compact optical tracking system recited in claim 21, wherein the optical servo module structure is affixed to a side of the magnetic head assembly and oriented to an angle of tape wrap of the magnetic tape.

23. (Original) The compact optical tracking system recited in claim 21, wherein the magnetic head further includes a read head section and a write head section and a cavity

between the read head section and the write head section, wherein the optical servo module structure is positioned in the cavity between the read head section and the write head section.

24. (Previously Presented) An optical tracking system for aligning a recording medium, comprising:

at least one source of coherent electromagnetic radiation;

an interference generating device;

wherein the interference generating device causes the superposition of coherent radiation emitted from the at least one source to form at least two spots on the recording medium;

wherein the two spots are formed at different distances from a track on the recording medium;

wherein the direction and magnitude of offset of the track is determined based on the relative locations of the at least two spots with respect to the track.

25. (Currently amended) The system of Claim 24 wherein the ~~track is a servo track~~ two spots are also formed at different lateral locations along a track on the recording medium.

26. (Currently amended) The system of Claim 24 wherein the ~~relative locations of the at least two spots are determined by measuring reflected intensity of the at least two spots~~ two spots are offset from one another in a transverse direction by approximately one-quarter of a track spacing between successive tracks on the recording medium.

27. (Currently amended) ~~The optical tracking system of Claim 24~~ An optical tracking system for aligning a recording medium, comprising:

at least one source of coherent electromagnetic radiation;

an interference generating device;

wherein the interference generating device causes the superposition of coherent radiation emitted from the at least one source to form at least two spots on the recording medium;

wherein the two spots are formed at different distances from a track on the recording medium;

wherein the direction and magnitude of offset of the track is determined based on the relative locations of the at least two spots with respect to the track, wherein the at least two spots comprise a first group of spots and a second group of spots, wherein the intensity of the first group of spots is averaged and the intensity of the second group of spots is averaged.